



PATENT  
Atty. Dkt. No. Wood 27

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of: Thomas Huntington  
Wood

Serial No.: 09/332,264

Confirmation No.: 2709

Filed: June 11, 1999

For: System for Operating an  
Ethernet Data Network over a  
Passive Optical Network  
Access System

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Group Art Unit: 2633

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Examiner: Shi K. Li

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**APPEAL BRIEF**

Appellant submits this Appeal Brief to the Board of Patent Appeals and Interferences on appeal from the decision of the Examiner of Group Art Unit 2633 dated January 26, 2004, finally rejecting claims 1, 2, 4, 5 and 7-15. Please charge the fee of \$320.00 for filing this brief to Deposit Account No. 20-0782/Wood27. **Three copies of this brief are submitted for use by the Board.**

**Real Party in Interest**

The present application has been assigned to Lucent Technologies, Inc.

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### **Related Appeals and Interferences**

Appellant asserts that no other appeals or interferences are known to the Appellant, the Appellant's legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

### **Status of Claims**

Claims 1, 2, 4, 5 and 7-15 are pending in the application.

### **Status of Amendments**

A first Office Action in the subject application was mailed to the Appellant on March 14, 2002. Appellant filed a response to the first Office Action on June 14, 2002. The first response included arguments directed at traversing the Examiner's rejections under 35 U.S.C. §103; no claims were amended.

The Examiner mailed a second Office Action on August 12, 2002 in which he cited new art. Appellant responded to the Examiner's second Office Action on December 12, 2002. The second response amended claims 1 and 7 and included arguments directed at traversing the Examiner's rejections under 35 U.S.C. §102 and 103. Additionally, claims 3 and 6 were canceled in the second response.

The Examiner mailed a third Office Action on February 7, 2003 in which he cited new art. Appellant responded to the third Office Action on May 5, 2003. The third response included arguments directed at traversing the Examiner's rejection under 35 U.S.C. §102 and 103; no amendments to the claims were made.

The Examiner mailed a fourth office action on July 31, 2003 in which he cited new art. Appellant responded to the fourth Office Action on October 28, 2003. The fourth response included arguments directed at traversing the Examiner's rejections under 35 U.S.C. §103; no amendments to the claims were made.

The Examiner mailed a Final Office Action on January 26, 2004. Appellant filed a Response after Final Office Action pursuant to 37 C.F.R. §1.116. The Response after Final included arguments directed at traversing the Examiner's rejections under 35 U.S.C. §103; no claims were amended. The Examiner sustained his rejection in an

Advisory Action mailed June 4, 2004. In the Advisory Action, Examiner indicated that the proposed arguments submitted under the Response after Final were considered, but did not place the application in condition for allowance. Accordingly, a Notice of Appeal was filed by the Appellant on June 28, 2004.

### **Summary of Invention**

The present invention is a data communications system which increases the applicability of Ethernet functionality, particularly to the area of residential data delivery.

A single Passive Optical Network (PON) shared bus is subdivided into several logical busses, so that each of a plurality of Network Interface Cards (NIC)s associated with a corresponding plurality of Optical Network Units (ONUs) can communicate with a head-end on its own logical bus. The logical busses are configured so that the individual (NIC)s can communicate with the head-end independently of each other, so that collisions between NICs do not take place. As a result, the present invention overcomes the problem of limited bus length (~100m) which characterizes conventional Ethernet data networks. In accordance with the present invention, Ethernet data service over optical fiber networks on the order of 20 km long is possible.

More specifically, multiple upstream logical busses are created using Subcarrier Multiple Access (SCMA) in which each ONU is assigned a different subcarrier frequency. Instead of transmitting its upstream data with baseband signaling, each ONU modulates an RF carrier at its assigned subcarrier frequency with its data. Techniques such as Frequency-shift keying (FSK) or quadrature phase-shift keying (QPSK) can be used to modulate the subcarriers. As long as the information bandwidths of the various upstream signals do not overlap, each ONU has its own logical bus, and transmits to the head-end at any time without fear of colliding with signals from another ONU.

In such embodiment, the head-end NIC transmitter 102 operates at a higher speed Ethernet than the ONU NIC transmitters 204. For example, if each user on a 16-way PON is to be provided with service on the order of 10 Mb/s (10-baseT), the head-end transmitter 102 can be operated at 100 Mb/s (100-baseT). Each ONU receiver 202 receives the 100 Mb/s signal and selects only packets designated for it by looking at the

Medium Access Control (MAC) address. The electrical signals commonly used in 10 and 100-baseT Ethernet are converted to optical signals for transmission on the PON. By sharing a single 100 Mb/s signal over 16 users, and considering some statistical multiplexing, the users receive downstream data service as good as, or better than, that provided by dedicated 10 Mb/s links. Alternatively, the head-end transmitter can operate at Gigabit Ethernet ("GbE" or 1000-baseT) and the users can each be provided with 100 Mb/s service (100-baseT).

In the present invention, the Appellant has described and claimed a novel data communications system that substantially overcomes the aforementioned problem associated with the prior art communication systems. The present data communication system is described on pages 7-12 of the Appellant's specification with reference to an exemplary system depicted in FIG. 2.

As suggested in MPEP 1206, Appellants now read the broadest appealed claim on the specification and drawings. However, it should be understood that the appealed claim may read on other portions of the specification or other figures that are not listed below.

Claim 1 (the broadest independent claim) is presented below with elements read on FIG. 2 as suggested. Claim 1 positively recites (with reference numeral added):

1. A data communications system comprising:
  - an outside plant, the outside plant including a distribution fiber 50, a splitter 40 and a plurality of drop fibers 60;
  - a head-end 10, the head-end further comprising an Ethernet adapter circuit 101 and being coupled to the splitter 40 via the distribution fiber 50;
  - a first network unit 20, the first network unit 20 being coupled to the splitter 40 via first of the plurality of drop fibers 60, wherein the first network unit 20 receives a first upstream data stream from a first user source via an Ethernet interface 203, modulates a first signal with the first upstream data stream and transmits the modulated first signal to the head-end 10 via the outside plant; and

a second network unit 20, the second network unit 20 being coupled to the splitter 40 via a second of the plurality of drop fibers 60, wherein the second network unit 20 receives a second upstream data stream from a second user source via an Ethernet interface 203, modulates a second signal with the second upstream data stream and transmits the modulated second signal to the head-end 10 via the outside plant,

whereby the first and second network units 20's can transmit the modulated first and second signals to the head-end 10 substantially simultaneously without collision.

### **Issues Presented**

1. Whether claims 1, 2, 4, 5 and 7-15 are patentable under 35 U.S.C. §103 over U.S. Patent No. 5,311,344 to Bohn in view of U.S. Patent No. 6,587,476 to Lewin.
2. Whether claim 8 is patentable under 35 U.S.C. §103 in view of Bohn and Lewin in further view of U.S. Patent No. 6,137,607 to Feldman.
3. Whether claim 9 is patentable under 35 U.S.C. §103(a) in view of Bohn and Lewin in further view of U.S. Patent No. 6,542,722 to Sorrells.
4. Whether claim 11 is patentable under 35 U.S.C. §103 in view of Bohn and Lewin in further view of U.S. Patent No. 5,550,666 to Zirngibl.

### **Grouping of Claims**

The rejected claims of each issue have been grouped together in the rejection. Appellants urge that each of the rejected claims stands on its own recitation, the claims being considered to be separately patentable for reasons set forth in more detail infra.

### **The References**

The following references are relied on by the Examiner:

Author	Publication Title or Reference number	Publication Date
Bohn	US Patent No. 5,311,344	May 10, 1994
Lewin	US Patent No. 6,587,476	July 1, 2003
Feldman	US Patent No. 6,137,607	October 24, 2000
Sorrells	US Patent No. 6,542,722	April 1, 2003
Zirngibl	US Patent No. 5,550,666	August 27, 1996

### **Brief Description of the References**

United States Patent No. 5,311,344 to Bohn et al. (hereinafter Bohn) teaches a bi-directional, non-interfering lightwave transmission system for broadband services on a single fiber. Transmission is accomplished by simultaneously combining wavelength-division, time-division, and subcarrier multiplexing on the downstream and upstream transmissions. High speed electrical data signals are time-division multiplexed 22 into a composite signal which modulates a standard diode laser 23 operating at a first wavelength. Data signals from an individual subscriber 5 are modulated onto a subcarrier designated solely for the particular subscriber which, in turn, modulates a laser 55 operating at a second wavelength. Extraction and insertion of the upstream and downstream (collisionless) transmissions at the subscriber and exchange locations is accomplished with wavelength selective couplers (21 and 51) and nothing more (such as Ethernet). (see Abstract and FIGs. 1 and 2.)

United States Patent 6,587,476 to Lewin teaches an apparatus for and a method of encapsulating Ethernet frame data in very high speed digital subscriber line (VDSL)

frames. The VDSL frames are transmitted over a point-to-point VDSL link where they are subsequently extracted and forwarded as a standard Ethernet frames. The block diagram of FIG. 1 contains a plurality of Ethernet to VDSL Consumer Premises Equipment (CPEs) coupled to a DSL Access Multiplexer (DSLAM) over a VDSL transport facility that utilizes the HDLC protocol. The system, generally referenced 10, comprises one or more channels 12 labeled channel #1 through channel #N. Each channel comprises an Ethernet to VDSL (CPE) 14 coupled to an Ethernet source 18 on one side and a VDSL transport facility 16 on the other. Each channel is coupled, via their respective VDSL facilities 16 to the DSLAM 20. The DSLAM 20 is also coupled to a Fast Ethernet source 22, e.g., 100BaseTx or 100BaseFx Ethernet source. (per Col. 8, Lines 15-26 and FIG. 1). The system improves data transmission for networks having twisted pair wires only, without contemplating other (e.g., optical) transmission mediums.

United States Patent No. 6,137,607 to Feldman teaches a broadband communications method and apparatus for reducing optical beat interference. Specifically, transmission apparatus 200, which generally resides in subscriber premises (104-107 of FIG. 1) is optically connected by access 210 which corresponds to one of the subscriber access lines 104(a)-107(a). A data source 203 generates subscriber data which may modulate an rf carrier in modem 202, or alternatively be sent directly to a laser module 201 as baseband data. The output signal of modem 202 is presented to a laser module 201 which generates laser light in response and onto access 210. (see FIG. 2). The method and apparatus eliminates OBI by operating the laser in a burst mode. The laser is turned on rapidly just prior to the transmission of a first bit of data and shut off rapidly shortly after the transmission of a final bit. Accordingly, bias control 204, detects the output of modem and turns on the laser 201 as the first bit of data is transmitted. (see Col. 2, lines 49-67).

United States Patent No. 6,542,722 to Sorrells teaches a method and system wherein a signal with a lower frequency is up-converted to a higher frequency. The frequency up-converter is used as a system and method for transmitting an

electromagnetic (EM) signal. Techniques by which information can be imparted onto EM signals to be transmitted are called modulation. These techniques include frequency modulation (FM), phase modulation (PM), amplitude modulation (AM), quadrature-phase shift keying (QPSK), frequency shift keying (FSK), phase shift keying (PSK), amplitude shift keying (ASK), etc. (per Column 11, lines 49-61 and Abstract).

United States Patent No. 5,550,666 to Zirngibl teaches a wavelength division multiplexed multi-frequency optical source and broadband incoherent optical source. The wavelength division multiplexing multi-frequency optical source is used to provide downstream transmission of information signals at discrete optical wavelengths from a central office to a plurality of optical network units. A passive optical demultiplexer in a remote node routes the downstream information signals to the optical networks according to optical wavelength. Broadband incoherent sources are used to provide upstream information signals at discrete optical wavelengths (e.g., 1.3-1.5 $\mu$ m) which are multiplexed and then routed to the central office for demultiplexing by the passive optical demultiplexer. A wavelength selective coupler in the central office and in each optical network unit combines and segregates downstream and upstream signals of different optical wavelengths for routing to a desired destination. (see Abstract)

### **ARGUMENT**

#### **THE ISSUES UNDER 35 U.S.C. §103**

It is submitted that a reasonable interpretation of the references as proposed by the Examiner would not have resulted in the invention recited in the Appellants' claims.

#### **Issue 1 - 35 U.S.C. §103 – Claims 1, 2, 4, 5, 7-15**

The Examiner has stated that Bohn teaches all of the features of claims 1, 2, 4, 5, 7-15 except that Bohn does not teach the Ethernet interface for providing the upstream data. The Examiner states that Ethernet is a popular network interface and can be found in most computers for interconnecting with other computers. Lewin



allegedly emphasizes this fact in his "Background of the Invention" section and in FIG. 1 teaches the use of 10base-T Ethernet interfaces for receiving data from subscribers. The Examiner also states that Fig. 7 of Lewin teaches the use of an Ethernet switch to combine the data from individual subscribers. Accordingly, the Examiner concludes that one of ordinary skill in the art would have been motivated to combine the teachings of Lewin with the data communication system of Bohn to use Ethernet interfaces for receiving subscriber data because the Ethernet interfaces are properly found in home and office computers. Additionally, in using an Ethernet switch, there is no collision between different ports. The Appellants strongly disagree.

Although the Appellants have brought to the Examiner's attention that Lewin does not provide sufficient motivation to be combined with Bohn and that reliance upon the level of ordinary skill in the art cannot be used as a suggestion to combine references, the Examiner was not persuaded. Specifically, the Appellants hold that the mere popularity of a given feature in the references cannot be used as a suggestion or a motivation to combine the teachings because the references must suggest the desirability of a claimed invention. Additionally, the Examiner failed to be persuaded that he had not properly established the prima facie case of obviousness in view of Appellants arguments to the contrary.

The burden for establishing a prima facie case of obviousness falls on the Examiner, MPEP §2142. A basic requirement of establishing a prima facie case of obviousness is that the references must teach or suggest all the claim limitations, MPEP §2143. The Appellants assert that the Examiner has failed to establish a prima facie case because Ethernet interfaces in first and second network units that modulate first and second signals in first and second upstream data streams in an optically based data communication system (see distribution fiber 50, splitter 40 and plurality drop fibers 60) is not taught or suggested in the references of record.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined)

must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Appellant's disclosure. In re Vacek, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The first criteria has clearly not been met as mere popularity of a given feature (in this case the use of Ethernet for interconnecting computers) cannot be used as suggestion or motivation to combine the teachings. It has been well established that the prior art must suggest the desirability of the claimed invention. The level of skill in the art cannot be relied upon to provide the suggestion to combine references. As-Site Corp. v VSI Int'l Inc. 174 F.3d 1308 50 USPQ2d 1161 (Fed Cir. 1999). The Examiner has offered that one ordinary skill in the art would have been motivated to combine Bohn with Lewin because Ethernet interfaces are popular and are found (or otherwise equipped) in most home and office computers. This line of reasoning is inadequate to support a conclusion of obviousness because the Examiner is relying on the level of ordinary skill in the art to suggest the combination of the references rather than the references themselves.

Additionally, it is submitted that the second criteria has also not been met. Specifically, there is no reasonable expectation of success indicated in a combination of Ethernet into the system of Bohn. Bohn's system is designed by strategically combining aspects of WDM, TDM and subcarrier multiplexing (per Abstract) to achieve its objectives. Bohn's solution already purports to have non-interfering transmission of broadband services on a single fiber as a result of its design; no further solutions (such as Ethernet) are contemplated, considered necessary or offered. Accordingly, the Examiner's impermissible hindsight cannot be used to introduce other aspects (Ethernet protocols) as sufficiently acceptable or advisable to integrate into Bohn's system. Specifically and as presented in Col. 2, lines 42-51, the existing PON is upgraded by the combining aspects of WDM, TDM and subcarrier multiplexing as follows:

The current, low-speed fiber network is upgradeable to handle the broadband services in accordance with the principles of the present invention by using coarse wavelength-division multiplexing (WDM) at each end of the network together with time-division multiplexing (TDM) for outbound service ("downstream") and sub-carrier multiplexing (SCM) for

subscriber inbound service ("upstream"). The upgraded network is a Passive Optical Network (PON), and is wavelength-independent which permits further upgrading without difficulty.

Additionally, Appellant indicates that Lewin speaks of cost effective, high speed networks and that telephone companies are eager to deliver same (Col. 1, lines 22-24). The phone companies (and reference's) response to serving this need is thru improved VDSL's, not an optical communications system as described and claimed in the subject invention. Thus, there is an inconsistency between the problem solving techniques of the two references because one system is optically based (Bohn) and the other is twisted pair or 100Base-T based (Lewin). Any alleged popularity of Ethernet led the particular service provider of Lewin (a telephone company) to improve and adapt its existing twisted pair network, not to develop an optical network having the desired features of the subject invention. It was never a question or an argument as to whether these two technologies could be combined but rather there is no advantage to be gained by introducing Ethernet as a non-interfering transmission technique to Bohn when Bohn already solves his problem through the multiplexing technologies. Per Bohn, "Bidirectional, non-interfering transmission of broadband services on a single fiber is accomplished in accordance with the principles of the present invention by judiciously and simultaneously combining wavelength-division, time-division and subcarrier multiplexing on the downstream and upstream transmissions." Bohn, col. 1, lines 56-61. Therefore, Bohn achieves collisionless transmission in a completely different manner than that offered by the subject invention in terms of optical networks. The popularity that the Examiner alludes to at col. 1, lines 12-24 of Lewin is based on the eagerness of telephone companies to deliver broadband services along their twisted pair medium. Therefore, one concludes that it is twisted pair networks that are attempting to find higher bandwidth capabilities beyond VDSL and would look to and benefit from the popularity of Ethernet based on Lewin. Other types of networks are not considered and, in fact, it has been shown by Bohn that the problems can be solved by other techniques besides that of Ethernet in different systems.

Case law supports this reasoning:

A "trend" might very well constitute a suggestion or teaching to one of ordinary skill in the art to make "minor" changes from the prior art in accordance with that trend to produce the claimed invention. The existence of a trend depends on the content of the prior art, that is, what the prior art would have taught one of ordinary skill in this art at the time of this invention. Before proceeding to find a trend, it must first be determined whether one of ordinary skill would have had a motivation to combine references to form the trend. Evidence cutting against a trend includes various different methods used in the prior art to solve the problem faced by the inventor. Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH, 45 USPQ 2d at 1981. Cf. In re Chu, 66 F.3d 292, 298, 36 USPQ 2d 1089, 1094 (Fed. Cir. 1995) (when changes from the prior art are "minor" or "simple," an inquiry must be made as to whether "the prior art provides any teaching or suggestion to one of ordinary skill in the art to make the changes." Quoting Northern Telecom, Inc. v. Datapoint Corp., 908 F.2d 931, 935, 15 USPQ 2d 1321, 1324 (Fed. Cir. 1990)), 45 USPQ 2d at 1982.

Since Bohn disclosed multiplexing technologies for collisionless transmission in optical networks, one skilled in the art would not be motivated to combine the Ethernet features of Lewin's twisted pair network because a different method to solve this problem in optical networks was available. Additionally, the inclusion of Ethernet interfaces (203) and adapter circuits (101) as claimed should not be considered "minor" changes as they represent a departure from typical components that comprise an optically-based transmission system. Accordingly, it is submitted that there is insufficient support in the Examiner's rejections to conclude that it is obvious to combine the cited references to arrive at the claimed invention.

Furthermore, it is simply not permitted to selectively take bits and pieces of a reference and force them together to attempt to arrive at the subject invention. This has been well-established in case law. In this particular case, VDSL's have synchronizing

signals (SOC's) that are not compatible with Ethernet protocols (Lewin, Col. 3, line 62-Col 4, line 10). Lewin specifically presents a method and apparatus for encapsulating Ethernet frames using HDLC protocols so that they may be used in VDSL's. As such, it is submitted that Lewin has presented a solution to the problem of how to integrate high speed data communication links (using Ethernet) to end users in VDSL's operating along a twisted pair medium and not optically-based networks. The references must be taken in their entirety, including those portions which argue against obviousness. Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 230 U.S.P.Q. 416, 420 Fed. Cir. 1986). It is impermissible within the framework of the 35 U.S.C. § 103 to pick and choose from a reference only so much of it as will support a conclusion of obviousness to the exclusion of other parts necessary to a full appreciation of what the reference fairly suggests to one skilled in the art. Id. at 419. Hindsight is strictly forbidden. It is impermissible to use the claims as a framework to pick and choose among individual references to recreate the claimed invention Id. at 1600; W.L. Gore Associates, Inc., v. Garlock, Inc., 220 U.S.P.Q. 303, 312 (Fed. Cir. 1983). Since Lewin discloses a solution to improve the speed of DSL and twisted pair communications networks rather than optical networks, it is plain to see that the Examiner has resorted to piecemeal separation of certain features of Lewin (e.g. the Ethernet switch 130) and forced them into Bohn without regard for the basic premise of Lewin. Moreover, the combination of Bohn and Lewin includes a VDSL network which plainly teaches away from the subject invention; thus argues against obviousness.

As such, it is submitted that the *prima facie* case of obviousness to claim 1 has not been established by the Examiner; hence, reversal of the rejection is respectfully requested. Furthermore, claims 2, 4, 5, 7, 10, and 12-15 depend, either directly or indirectly from claim 1 and recite additional features thereof. As such, and for at least the same reasons discussed above with respect to claim 1, the Appellant submits that these dependent claims also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Appellant respectfully requests that rejection be reversed.

Issue 2 - 35 U.S.C. §103 – Claim 8

The Examiner has stated that the combination of Bohn and Lewin teach all the features of claims 1, 2, 4, 5, 7, 10 and 12-15 except that a bias control circuit is not taught. Further, the Examiner states that Feldman describes the operation of a bias control circuit that shuts off a laser in the absence of user data.

As discussed earlier under Issue 1 of Appellants' arguments to these rejections, the Examiner has failed to establish the *prima facie* case of obviousness with respect to claim 1 with the combination of Bohn and Lewin. Any additional references used to further establish obviousness of a dependent claim is similarly deficient for at least the same reasons discussed above with respect to claim 1. The Appellant submits that such dependent claims also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Appellant respectfully requests that rejection to claim 8 be reversed.

Issue 3 - 35 U.S.C. §103 – Claim 9

The Examiner has stated that the combination of Bohn and Lewin teach all the features of claims 1, 2, 4, 5, 7, 10 and 12-15 except for modulation techniques for the upstream data. Additionally the Examiner indicates that Sorrells teaches techniques for modulations; therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the modulation method (QPSK) in combination with the communication system of Bohn and Lewin.

As discussed earlier under Section 1 of the Appellants' arguments to these rejections, the Examiner has failed to establish the *prima facie* case of obviousness with respect to claim 1 with the combination of Bohn and Lewin. Any additional references used to further establish obviousness of a dependent claim is similarly deficient for at least the same reasons discussed above with respect to claim 1. The Appellant submits that such dependent claims also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Appellant respectfully requests that rejection to claim 9 be reversed.

Issue 4 - 35 U.S.C. §103 – Claim 11

The Examiner has stated that Bohn and Lewin present the modified data communication system without discussion of a specific wavelength for the upstream data channel. However, the Examiner offers that Zirngibl teaches the use of a 1.3  $\mu\text{m}$  wavelength for upstream data.

As discussed earlier under Section 1 of the Appellants' arguments to these rejections, the Examiner has failed to establish the *prima facie* case of obviousness with respect to claim 1 with the combination of Bohn and Lewin. Any additional references used to further establish obviousness of a dependent claim is similarly deficient for at least the same reasons discussed above with respect to claim 1. The Appellant submits that such dependent claims also fully satisfy the requirements of 35 U.S.C. §103 and are patentable thereunder. Therefore, the Appellant respectfully requests that rejection to claim 11 be reversed.

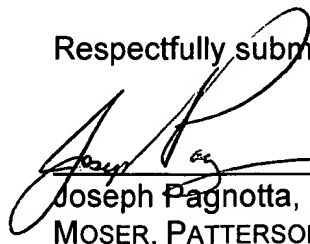
**Conclusion**

For the reasons advanced above, Appellants respectfully urge that the rejection of claims 1, 2, 3, 4, and 7-15 as being unpatentable under 35 U.S.C. §103 are improper. Reversal of the rejections in this appeal is respectfully requested.

Please charge Deposit Account 20-0782 in the amount of \$330 for the appeal Brief under 37 CFR 1.17(c). If necessary, please charge any shortage in fees in connection with the filing of this paper or please credit any excess fees to the above referenced deposit account.

August 25, 2004

Respectfully submitted,

  
\_\_\_\_\_  
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## APPENDIX

1. A data communications system comprising:
  - an outside plant, the outside plant including a distribution fiber, a splitter and a plurality of drop fibers;
  - a head-end, the head-end further comprising an Ethernet adapter circuit and being coupled to the splitter via the distribution fiber;
  - a first network unit, the first network unit being coupled to the splitter via a first of the plurality of drop fibers, wherein the first network unit receives a first upstream data stream from a first user source via an Ethernet interface, modulates a first signal with the first upstream data stream and transmits the modulated first signal to the head-end via the outside plant; and
  - a second network unit, the second network unit being coupled to the splitter via a second of the plurality of drop fibers, wherein the second network unit receives a second upstream data stream from a second user source via an Ethernet interface, modulates a second signal with the second upstream data stream and transmits the modulated second signal to the head-end via the outside plant,whereby the first and second network units can transmit the modulated first and second signals to the head-end substantially simultaneously without collision.
2. The system of claim 1, wherein at least one of the first and second signals is a carrier signal.
4. The system of claim 1, wherein the first and second network units comprise optical network units.
5. The system of claim 1, wherein the head-end receives the first and second upstream data streams and provides the first and second upstream data streams in a packet format.



7. The system of claim 2, wherein each network unit includes:  
an adapter circuit, the adapter circuit receiving the upstream data;  
a modulator, the modulator being coupled to the adapter circuit and modulating the carrier signal with the upstream data; and  
a transmitter, the transmitter being coupled to the modulator and generating an optical signal in accordance with the modulated carrier signal.
8. The system of claim 7, wherein each network unit includes a bias control circuit coupled between the modulator and the transmitter, the bias control circuit disabling the transmitter in the absence of a signal from the modulator.
9. The system of claim 7, wherein the modulator comprises a quadrature phase-shift keying modulator.
10. The system of claim 7, wherein the modulator comprises a frequency-shift keying modulator.
11. The system of claim 7, wherein the transmitter includes a 1.3  $\mu\text{m}$  laser.
12. The system of claim 7, wherein the adapter circuit provides an Ethernet interface for coupling to a data communications device.
13. The system of claim 1, wherein the head-end transmits a downstream data stream to the first and second network units via the outside plant.
14. The system of claim 1, wherein:  
the head-end includes a transmitter, a receiver and a wavelength-division multiplexing device, and  
each network unit includes a transmitter, a receiver, and a wavelength-division multiplexing device,

wherein in each of the head-end and the network units, the wavelength-division multiplexing device is coupled to the outside plant, the receiver and the transmitter, the wavelength-division multiplexing device coupling optical signals of different wavelengths on the outside plant.

15. The system of claim 14, wherein the receiver in the head-end and the transmitters in the network units operate at a first wavelength and the transmitter in the head-end and the receivers in the network units operate at a second wavelength.



08-26-04

AF/2633/20

PTO/SB/21 (04-04)

Approved for use through 07/31/2006. OMB 0651-0031

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## TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/332,264
Filing Date	6/11/99
First Named Inventor	Thomas Huntington Wood
Art Unit	2633
Examiner Name	Shi K. Li
Attorney Docket Number	Wood 27

Total Number of Pages in This Submission

### ENCLOSURES (check all that apply)

<input checked="" type="checkbox"/> Fee Transmittal Form  <input type="checkbox"/> Fee Attached  <input type="checkbox"/> Amendment / Reply  <input type="checkbox"/> After Final  <input type="checkbox"/> Affidavits/declaration(s)  <input type="checkbox"/> Extension of Time Request  <input type="checkbox"/> Express Abandonment Request  <input type="checkbox"/> Information Disclosure Statement  <input type="checkbox"/> Certified Copy of Priority Document(s)  <input type="checkbox"/> Response to Missing Parts/ Incomplete Application  <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s)  <input type="checkbox"/> Licensing-related Papers  <input type="checkbox"/> Petition  <input type="checkbox"/> Petition to Convert to a Provisional Application  <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address  <input type="checkbox"/> Terminal Disclaimer  <input type="checkbox"/> Request for Refund  <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Technology Center (TC)  <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences  <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)  <input type="checkbox"/> Proprietary Information  <input type="checkbox"/> Status Letter  <input type="checkbox"/> Other Enclosure(s) (please identify below):
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Remarks

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### SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name  
Joseph Pagnotta, Agent, Reg. No. 39,322  
Moser, Patterson & Sheridan, LLP

Signature

Date

August 25, 2004

### CERTIFICATE OF EXPRESS MAIL

I hereby certify that this correspondence is being deposited with the United States Postal Service in an envelope as "Express Mail Post Office Addressee" mailing label no. **EV177157237US** addressed to: Mail Stop appeal Brief - Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

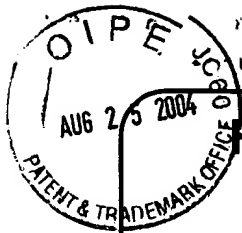
Typed or printed name

Signature

Date

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 330

## Complete if Known

Application Number 09/332,264  
Filing Date 6/11/99  
First Named Inventor Thomas Huntington Wood  
Examiner Name Si K. Li  
Art Unit 2633  
Attorney Docket No. Wood 27

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## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit Account Number 20-0782

Deposit Account Name Moser, Patterson & Sheridan, LLP

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments  
☒ Charge any additional fee(s) during the pendency of this application  
☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1)

(\$ 0)

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims  -20 \*\* =  0 X  =  0  
Independent Claims  -3 \*\* =  0 X  =  0  
Multiple Dependent  X  =  0

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1202	18	2202	9	Claims in excess of 20	
1201	86	2201	43	Independent claims in excess of 3	
1203	290	2203	145	Multiple dependent claim, if not paid	
1204	86	2204	43	** Reissue independent claims over original patent	
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent	

SUBTOTAL (2)

(\$ 0)

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet.	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	420	2252	210	Extension for reply within second month	
1253	950	2253	475	Extension for reply within third month	
1254	1,480	2254	740	Extension for reply within fourth month	
1255	2,010	2255	1,005	Extension for reply within fifth month	
1401	330	2401	165	Notice of Appeal	
1402	330	2402	165	Filing a brief in support of an appeal	330
1403	290	2403	145	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,330	2453	665	Petition to revive - unintentional	
1501	1,330	2501	665	Utility issue fee (or reissue)	
1502	480	2502	240	Design issue fee	
1503	640	2503	320	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17 (q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	770	2809	385	Filing a submission after final rejection (37 CFR § 1.129(a))	
1810	770	2810	385	For each additional invention to be examined (37 CFR § 1.129(b))	
1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3)

(\$ 330)

## SUBMITTED BY

Name (Print/Type) Joseph Pagnotta Registration No. (Attorney/Agent) 39,322 Telephone (732) 530-9404  
Signature [Signature] Date August 25, 2004

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

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